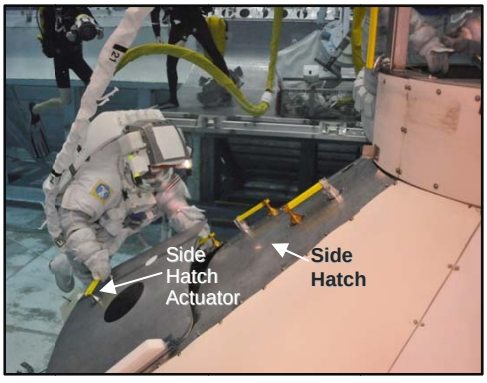
ORION
CREW EXPLORATION VEHICLE

WEEKLY ACCOMPLISHMENTS

07.31.09

The Ground Test Article (GTA) Thermal Protection System (TPS) composite backshell lay-up molds arrived at Lockheed Martin in Denver (Photos top and bottom right). There are two molds, one for the lower backshell panels and the second for the mid backshell panels. The composite material being utilized is a new cutting edge material system that can withstand much higher temperatures than typical composite materials. This is a new material system that is being developed specifically for the Orion Project. The GTA TPS backshell panels will be fabricated over the next several months before being delivered to the Michoud Facility for integration to the GTA vehicle.

The Orion Extravehicular Activity (EVA) Installable handrails and handrail receptacles were evaluated during several NASA/JSC Neutral Buoyancy Laboratory (NBL) runs (Photos bottom). The NBL runs, coordinated with NBL and mission operations personnel, were planned and sponsored by the EVA System and Orion Projects. The runs took advantage of International Space Station (ISS) EVA training sessions utilizing the Extravehicular Mobility Units (EMUs), with time made available at the end of each of these training sessions to support the project evaluations. In order to facilitate the evaluations, a Russian Functional Cargo Block (FGB) Mockup was modified.



The Crew Exploration Vehicle Aerosciences Panel aero thermodynamic 66-CH Phase I test model was installed in the LENS-I facility at Calspan University of Buffalo Research Center in New York. This test will obtain high fidelity heatshield data including the localized effects of the compression cavity geometry and tension tie protuberances.

Drop testing of the half scale boilerplate onto the Kennedy Space Center surrogate sand bed at the Langley Research Center vertical drop tower was completed with a total of 12 tests performed. The last two tests were conducted at an impact velocity of 35 ft/s with the test article at a hang angle of 23 and 33 degrees respectively. The sand at the time of impact was between 100.5 and 100.7 pcf and 4.7 % moisture. Applied Research Associates' draft material model for the LaRC surrogate sand (at 100 pcfdry density and 5% water content) will be used in the LS-Dyna simulations of the impacts.

The Low Impact Docking System MMOD support bracket was revised to accept the addition of a gusset located on the tunnel. The secondary MMOD bracket was also updated to reflect the changes. Models were given to stress analysis to verify design will pass stress requirements.

Service Module Fairing Pyramid separation mechanism (PSM) test article #3 was tested with the revised load cycles per latest loads data book. All axial and lateral cyclic loads have been applied without significant wear to the Titanium substrate. There was significant wear and burnishing of the dry lube coating surfaces especially the flat outer lands and the center of the parts closest to the hole where the separation bolt passes thru.

Temporary vertical supports have been installed onto the Orion Ascent Abort-1 CM Heat Shield (Photo left). The bulkhead will be lifted onto the support structure pending gusset and fitting release.

Orion Facilities

Plumbrook Station - Sandusky, Ohio
Installation of the flowable concrete fill around the West perimeter of the Reverberant Acoustic Test Facility (RATF) for isolation of the slab from the building was completed.

Operation & Checkout Facility (O&C)
Kennedy Space Center, Florida
The National Historic Society completed the photographic documentation of the Altitude test chambers. NASA Administrator Charlie Bolden toured the Orion Operations and Checkout facility and was briefed on production plans (Photo right).

Michoud Assembly Facility (MAF) – New Orleans, Louisiana
Continued installation of truss stiffening steel and initiated installation of crane/truss spacer beams in Building 103 LAS/Composite Manufacturing Area